

Dial indicators are available in various ranges and graduations. They use three basic types of mounting bases: magnetic, clamp, or screw-in stud. When purchasing a dial indicator, select the magnetic stand type (B, **Figure 36**) with a continuous dial face (**Figure 37**).

Cylinder Bore Gauge

A cylinder bore gauge is similar to a dial indicator. The gauge set shown in **Figure 38** consists of a dial indicator, handle, and different length adapters (anvils) to fit the gauge to various bore sizes. The bore gauge is used to measure bore size, taper and out-of-round. When using a bore gauge, follow the manufacturer's instructions.

Compression Gauge

A compression gauge (**Figure 39**) measures combustion chamber (cylinder) pressure, usually in psi or kg/cm². The gauge adapter is either inserted or screwed into the spark plug hole to obtain the reading. Disable the engine so it will not start and hold the throttle in the wide-open position when performing a compression test. An engine that does not have adequate compression cannot be properly tuned. See Chapter Three.

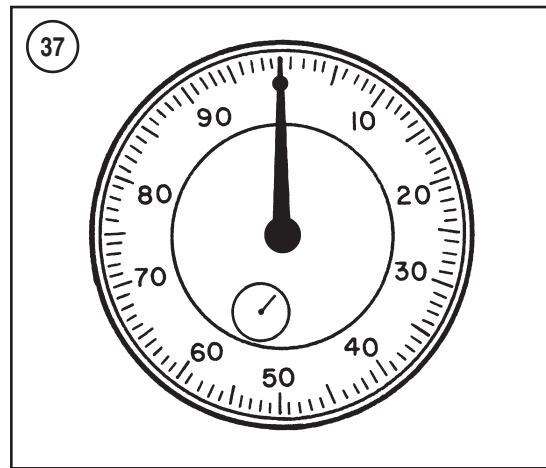
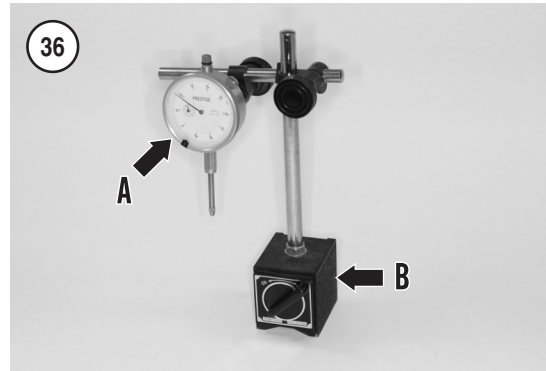
Spark Tester

A quick way to check the ignition system is to connect a spark tester to the end of the spark plug wire and operate the engine's kickstarter. A visible spark should jump the gap on the tester. A variety of spark testers are available from aftermarket manufacturers. Use of this tool is described in Chapter Two.

Multimeter

A multimeter (**Figure 40**) is an essential tool for electrical system diagnosis. The voltage function indicates the voltage applied or available to various electrical components. The ohmmeter function tests circuits for continuity and measures the resistance of a circuit.

Some test specifications for electrical components are based on results using a specific test meter. Results may vary if a meter not recommend by the



manufacturer is used. Such requirements are noted when applicable.

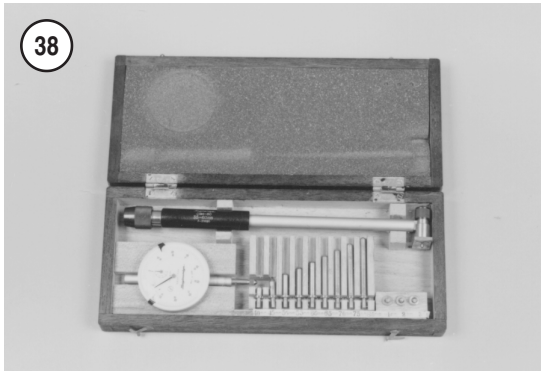
Ohmmeter (analog) calibration

Each time an analog ohmmeter is used or if the scale is changed, the ohmmeter must be calibrated. Digital ohmmeters do not require calibration.

1. Make sure the meter battery is in good condition.
2. Make sure the meter probes are in good condition.
3. Touch the two probes together and watch the needle. It must align with the 0 mark on the scale.
4. If necessary, rotate the set-adjust knob until the needle points directly to the 0 mark.

ELECTRICAL SYSTEM FUNDAMENTALS

A thorough study of the many types of electrical systems used in today's ATVs is beyond the scope



of this manual. However, an understanding of electrical basics is necessary to perform simple diagnostic tests.

Electrical Component Replacement

Most motorcycle dealerships and parts suppliers will not accept the return of any electrical part. If you cannot determine the exact cause of any electrical system malfunction, have a Honda dealership retest that specific system to verify your test results.

If you purchase a new electrical component(s), install it, and then find that the system still does not work properly, you will probably be unable to return the unit for a refund.

Consider any test results carefully before replacing a component that tests only *slightly* out of specification, especially resistance. A number of variables can affect test results dramatically. These include: the testing meter's internal circuitry, ambient temperature and conditions under which the machine has been operated.

Voltage

Voltage is the electrical potential or pressure in an electrical circuit and is expressed in volts. The more pressure (voltage) in a circuit, the more work that can be performed.

Direct current (DC) voltage means the electricity flows in one direction. All circuits powered by a battery are DC circuits.

Alternating current (AC) means that the electricity flows in one direction momentarily then switches to the opposite direction. Alternator output is an example of AC voltage. This voltage must be changed or rectified to direct current to operate in a battery powered system.

Resistance

Resistance is the opposition to the flow of electricity within a circuit or component and is measured in ohms. Resistance causes a reduction in available current and voltage.

Resistance is measured in an inactive circuit with an ohmmeter. The ohmmeter sends a small amount of current into the circuit and measures how difficult it is to push the current through the circuit.

An ohmmeter, although useful, is not always a good indicator of a circuit's actual ability under operating conditions. This is due to the low voltage (6-9 volts) that the meter uses to test the circuit. The voltage in an ignition coil secondary winding can be several thousand volts. Such high voltage can cause the coil to malfunction, yet the fault may not be detected during a resistance test.

Resistance generally increases with temperature. Perform all testing with the component or circuit at room temperature. Resistance tests performed at high temperatures may indicate high resistance

readings and result in the unnecessary replacement of a component.

Amperage

Amperage is the unit of measure for the amount of current within a circuit. Current is the actual flow of electricity. The higher the current, the more work that can be performed. However, if the current flow exceeds the circuit or component capacity, the system will be damaged.

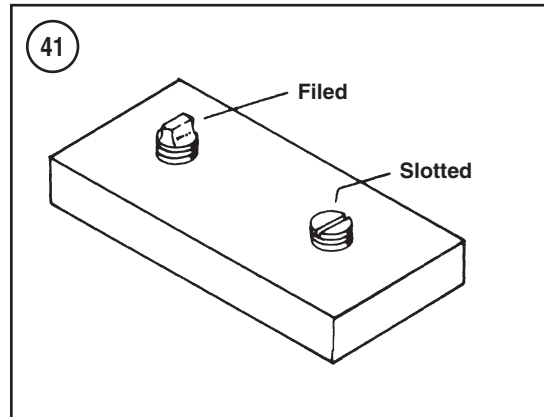
Electrical Tests

Refer to Chapter Nine for a description of various electrical tests.

BASIC SERVICE METHODS

Most of the procedures in this manual are straightforward and can be performed by anyone reasonably competent with tools. However, consider personal capabilities carefully before attempting any operation involving major disassembly.

1. Front, in this manual, refers to the front of the ATV. The front of any component is the end closest to the front of the ATV. The left and right sides refer to the position of the parts as viewed by the rider sitting on the seat facing forward. For example, the throttle control is on the right side of the handlebar.
2. Whenever servicing an engine or suspension component, secure the ATV in a safe manner.
3. Tag all similar parts for location, and mark all mated parts for position. Record the number and thickness of any shims as they are removed. Identify parts by placing them in sealed and labeled plastic bags.
4. Tag disconnected wires and connectors with masking tape and a marking pen. Do not rely on memory alone.
5. Protect finished surfaces from physical damage or corrosion. Keep gasoline and other chemicals off painted surfaces.
6. Use penetrating oil on frozen or tight bolts. Avoid using heat where possible. Heat can warp, melt or affect the temper of parts. Heat also damages the finish of paint and plastics.



7. When a part is a press fit or requires a special tool for removal, the information or type of tool is identified in the text. Otherwise, if a part is difficult to remove or install, determine the cause before proceeding.

8. To prevent objects or debris from falling into the engine, cover all openings.

9. Read each procedure thoroughly and compare the illustrations to the actual components before starting the procedure. Perform each procedure in sequence.

10. Recommendations are occasionally made to refer service to a dealership or specialist. In these cases, the work can be performed more economically by the specialist than by the home mechanic.

11. The term *replace* means to discard a defective part and install a new part in its place. *Overhaul* means to remove, disassemble, inspect, measure, repair and/or replace parts as required to recondition an assembly.

12. Some operations require the use of a hydraulic press. If a press is not available, have these operations performed by a shop equipped with the necessary equipment. Do not use makeshift equipment that may damage the ATV.

13. Repairs are much faster and easier if the ATV is clean before starting work. Degrease the ATV with a commercial degreaser; follow the directions on the container for the best results. Clean all parts with cleaning solvent as they are removed.

CAUTION

Do not apply a chemical degreaser to an O-ring drive chain. These chemicals will damage the O-rings.

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